

CLAIMS

What is claimed is:

1. An improved method for enhancing immune responses by upregulating co-stimulatory molecules, the upregulating of the co-stimulatory molecules comprising the steps of
5 administering a glucan-containing composition to an animal or a human, in sufficient dosage to cause an enhanced expression of co-stimulatory molecules on antigen presenting cells, the co-stimulatory molecules providing a second signal to T lymphocytes, causing the T lymphocytes to differentiate into armed effector cells.
2. The improved method of Claim 1 wherein the enhanced immune response is directed
10 toward pathogenic microorganisms or tumors.
3. The improved method of Claim 1 wherein the glucan-containing composition is at minimum a portion of a glucan selected from the group consisting of β 1,3-glucans and β 1,6-glucans.
4. The improved method of Claim 1 wherein the glucan-containing composition is
15 composed of a portion of a small particle glucan.
5. The improved method of Claim 1 wherein the molecule expressed is a molecule from a family of B7 molecules.
6. The improved method of Claim 5 wherein the family of B7 molecules comprises a molecule selected from the group including B7.1, B7.2, and B7.3.
- 20 7. A method for expressing an increased number of B7 molecules on the surface of an antigen presenting cell to more efficiently potentiate the immune system comprising the steps of:
obtaining an upregulating agent;

administering the upregulating agent to an organism; and,
allowing an upregulation of B7 molecules on a cell whereby an expression of the B7 molecules allows reaction with an effector cell, the reaction with the armed effector cell potentiating an immune response..

5 8. The method of Claim 7 wherein the upregulating agent is a glucan-containing composition.

9. The method of Claim 7 wherein the cells are antigen presenting cells selected from the group comprising macrophages, B lymphocytes, and dendritic cells.

10. The method of Claim 7 wherein the effector cell is a lymphocyte.

10 11. The method of Claim 10 wherein the lymphocyte is a T-Lymphocyte.

12 12. The method of Claim 7 wherein the B7 molecule is selected from the group comprising B7.1, B7.2 and B7.3.

13. The method of Claim 7 wherein the upregulating agent is administered as a pharmacological agent.

15 14. The method of Claim 13 wherein the pharmacological agent is a tablet.

15. The method of Claim 12 wherein the pharmacological agent is a capsule.

16. The method of Claim 13 wherein the pharmacological agent is a powder.

17. The method of Claim 13 wherein the pharmacological agent is a liquid.

18. An enhanced macrophage enhanced by immunological response modification, the
20 macrophage enhancing immunological response, comprising a macrophage enhanced by the delivery of a necessary signal that augments an upregulation of a costimulatory molecule, the

enhanced upregulation of the costimulatory molecule, in part, caused by a glucan containing composition interacting with a glucan containing composition.

19. The macrophage of Claim 18 wherein the costimulatory molecule is a B7 molecule.

20. The macrophage of Claim 19 wherein the B7 molecule is selected from a group
5 comprising B7.1, B7.2 and B7.3.

21. The macrophage of Claim 18 wherein the glucan containing composition is at least partially a β glucan.

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